FIG. 1

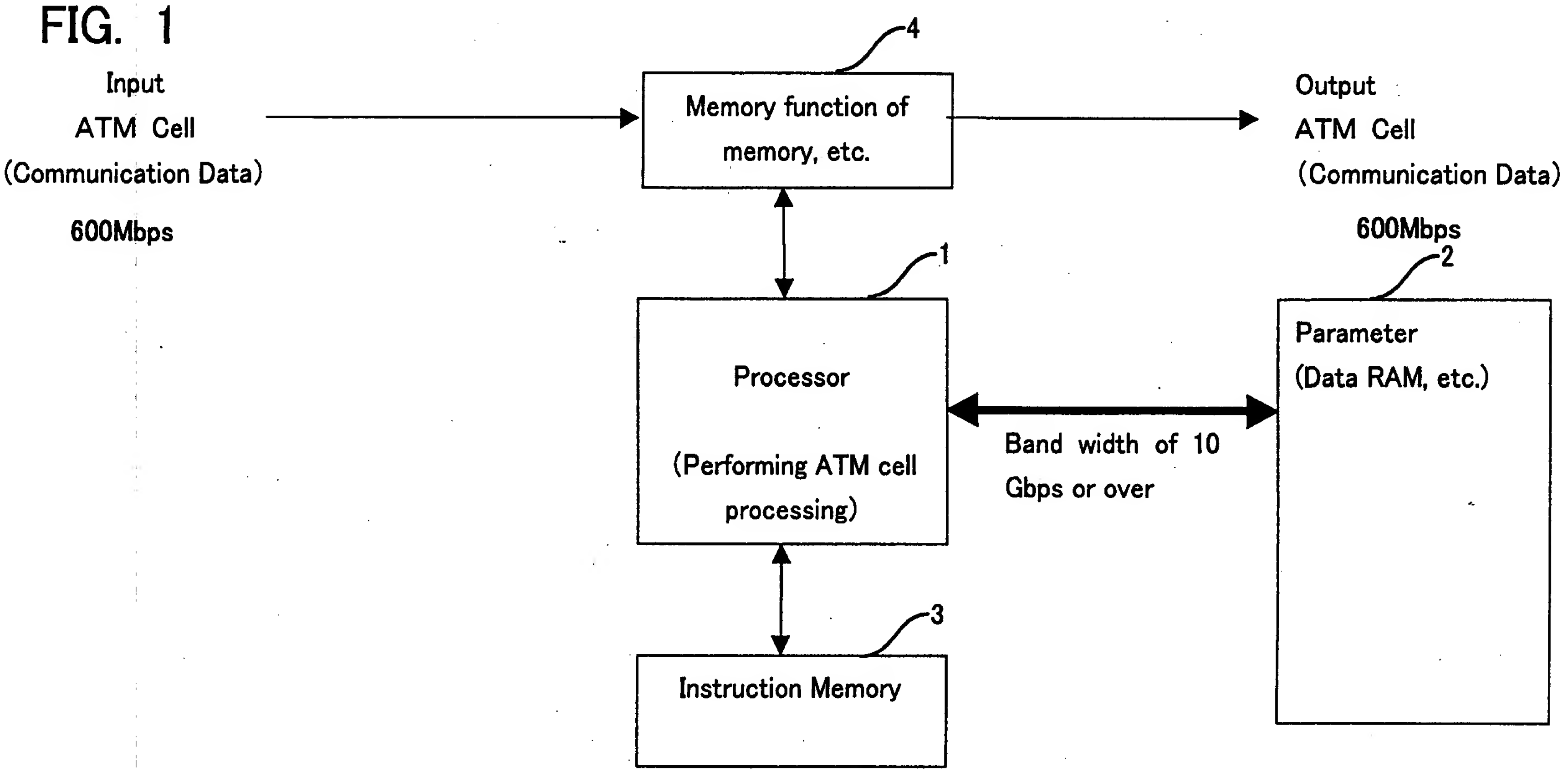

Input
ATM Cell
(Communication Data)
600Mbps
4
Memory function of memory, etc.
Output
ATM Cell
(Communication Data)
600Mbps
1
Processor
(Performing ATM cell processing)
2
Parameter
(Data RAM, etc.)
Band width of 10 Gbps or over
3
Instruction Memory

FIG. 2

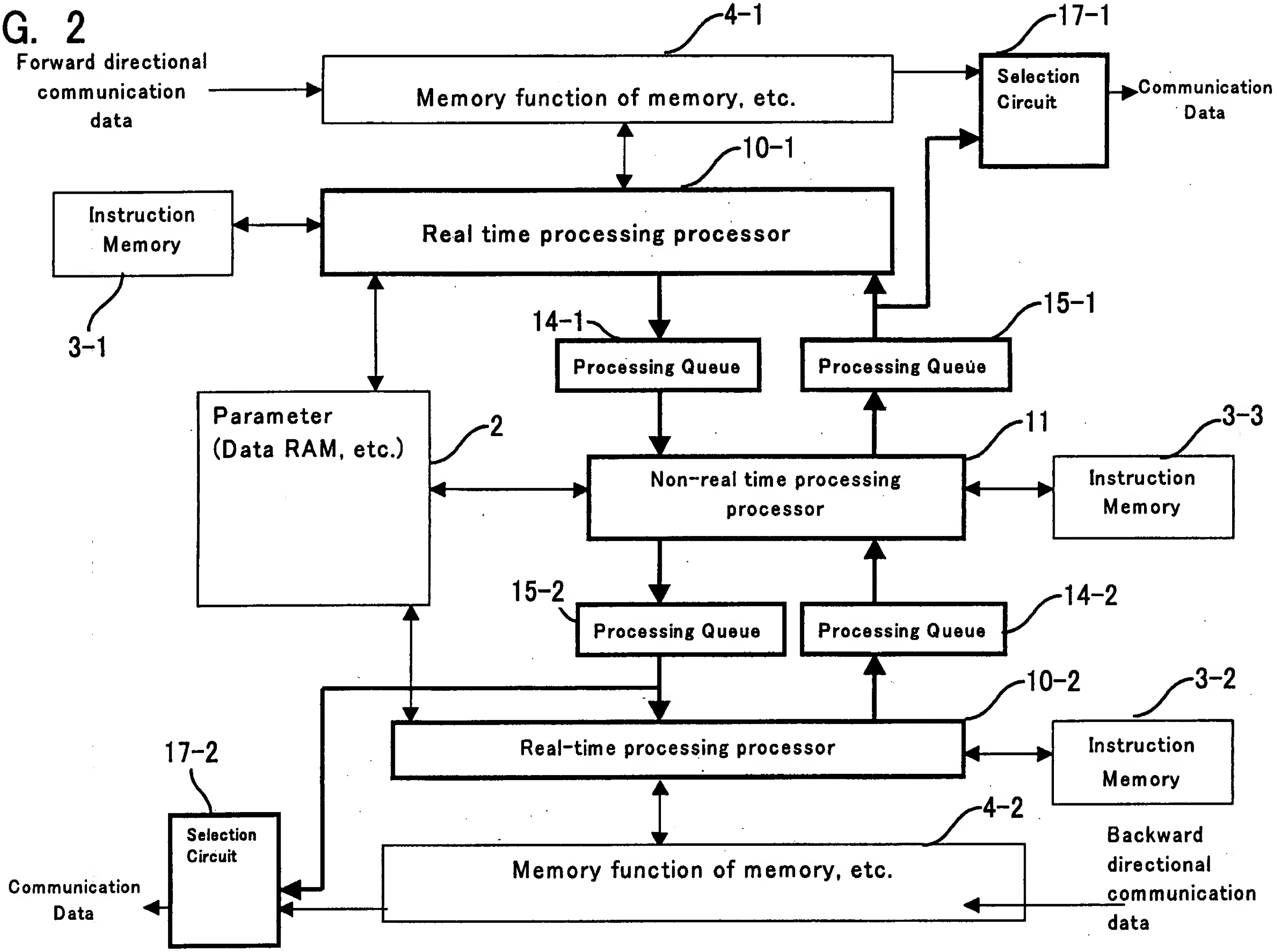
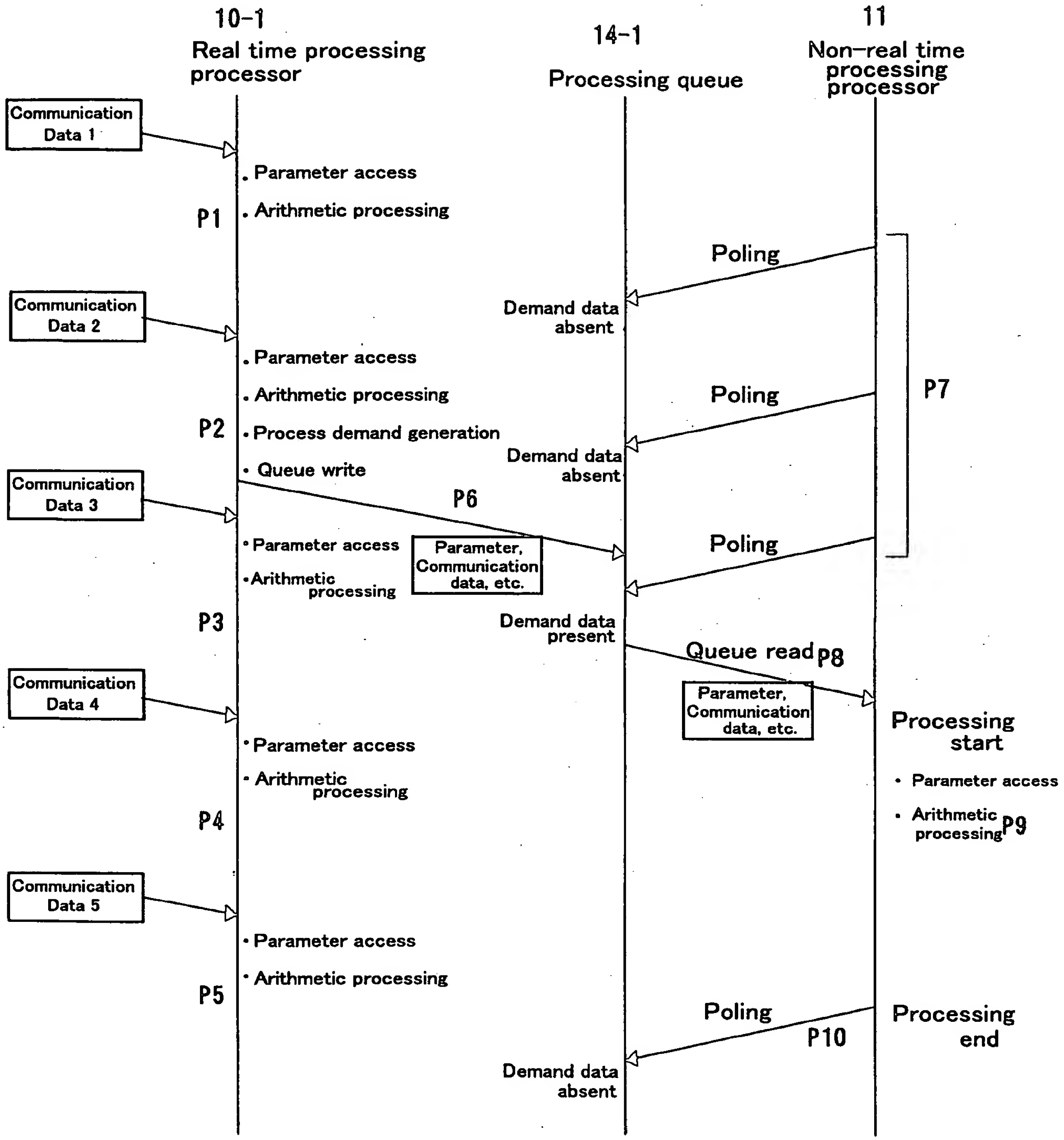

Forward directional communication data
4-1
Memory function of memory, etc.
17-1
Selection Circuit
Communication Data
10-1
Instruction Memory
Real time processing processor
3-1
14-1
Processing Queue
15-1
Processing Queue
Parameter (Data RAM, etc.)
2
11
Non-real time processing processor
3-3
Instruction Memory
15-2
Processing Queue
Processing Queue
14-2
10-2
3-2
17-2
Real-time processing processor
Instruction Memory
Selection Circuit
4-2
Communication Data
Memory function of memory, etc.
Backward directional communication data

FIG. 3


10-1
Real time processing processor
14-1
Processing queue
11
Non-real time processing processor
Communication Data 1
• Parameter access
• Arithmetic processing
P1
Poling
Demand data absent
Communication Data 2
• Parameter access
• Arithmetic processing
• Process demand generation
P2
• Queue write
Poling
Demand data absent
P7
Communication Data 3
P6
• Parameter access
• Arithmetic processing
Parameter, Communication data, etc.
Poling
P3
Demand data present
Queue read
P8
Parameter, Communication data, etc.
Processing start
Communication Data 4
• Parameter access
• Arithmetic processing
P4
• Parameter access
• Arithmetic processing
P9
Communication Data 5
• Parameter access
• Arithmetic processing
P5
Poling
P10
Processing end
Demand data absent

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O.G. FIG.

CLASS | SUBCLASS

FIG. 4

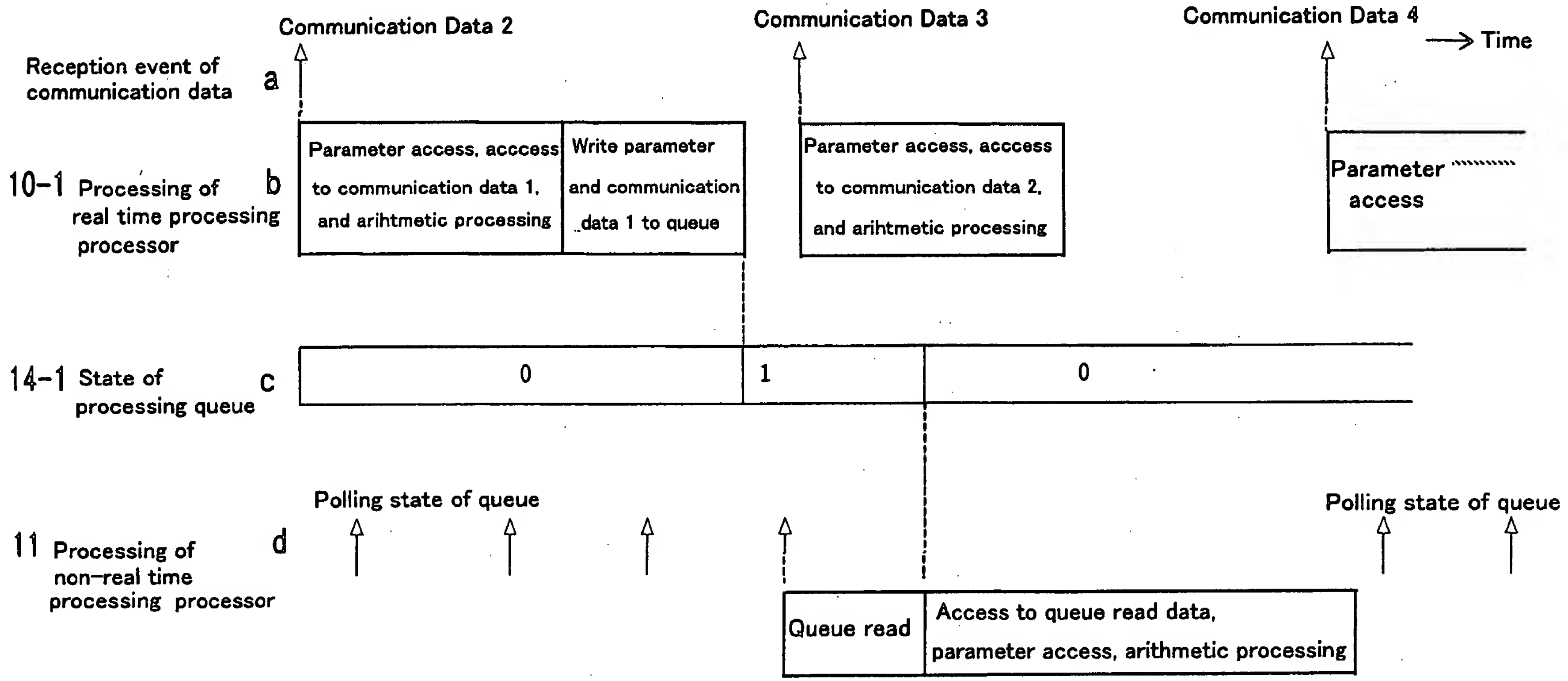
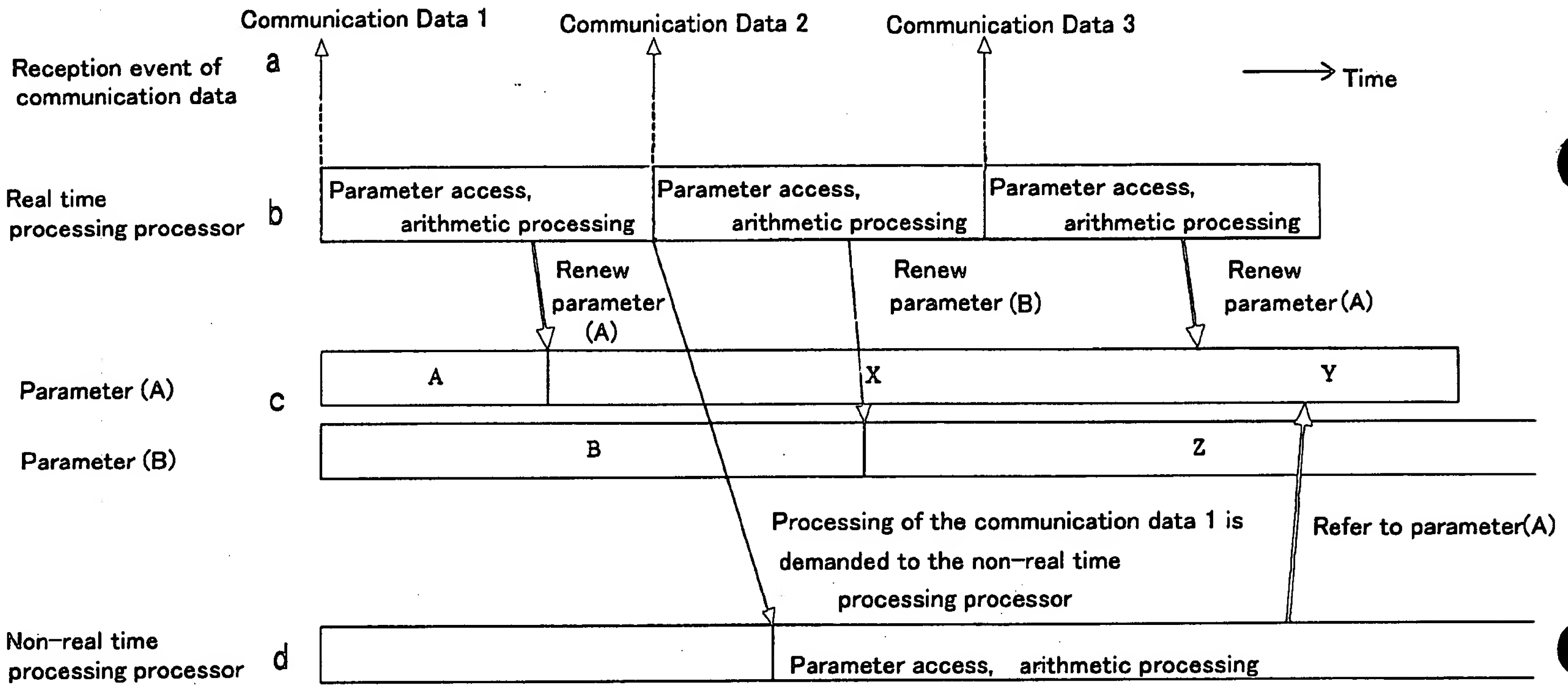


FIG. 5


Communication Data 1
Communication Data 2
Communication Data 3
Time
Reception event of communication data
a
Real time processing processor
b
Parameter access, arithmetic processing
Parameter access, arithmetic processing
Parameter access, arithmetic processing
Renew parameter (A)
Renew parameter (B)
Renew parameter (A)
Parameter (A)
c
A
X
Y
Parameter (B)
B
Z
Processing of the communication data 1 is demanded to the non-real time processing processor
Refer to parameter(A)
Non-real time processing processor
d
Parameter access, arithmetic processing

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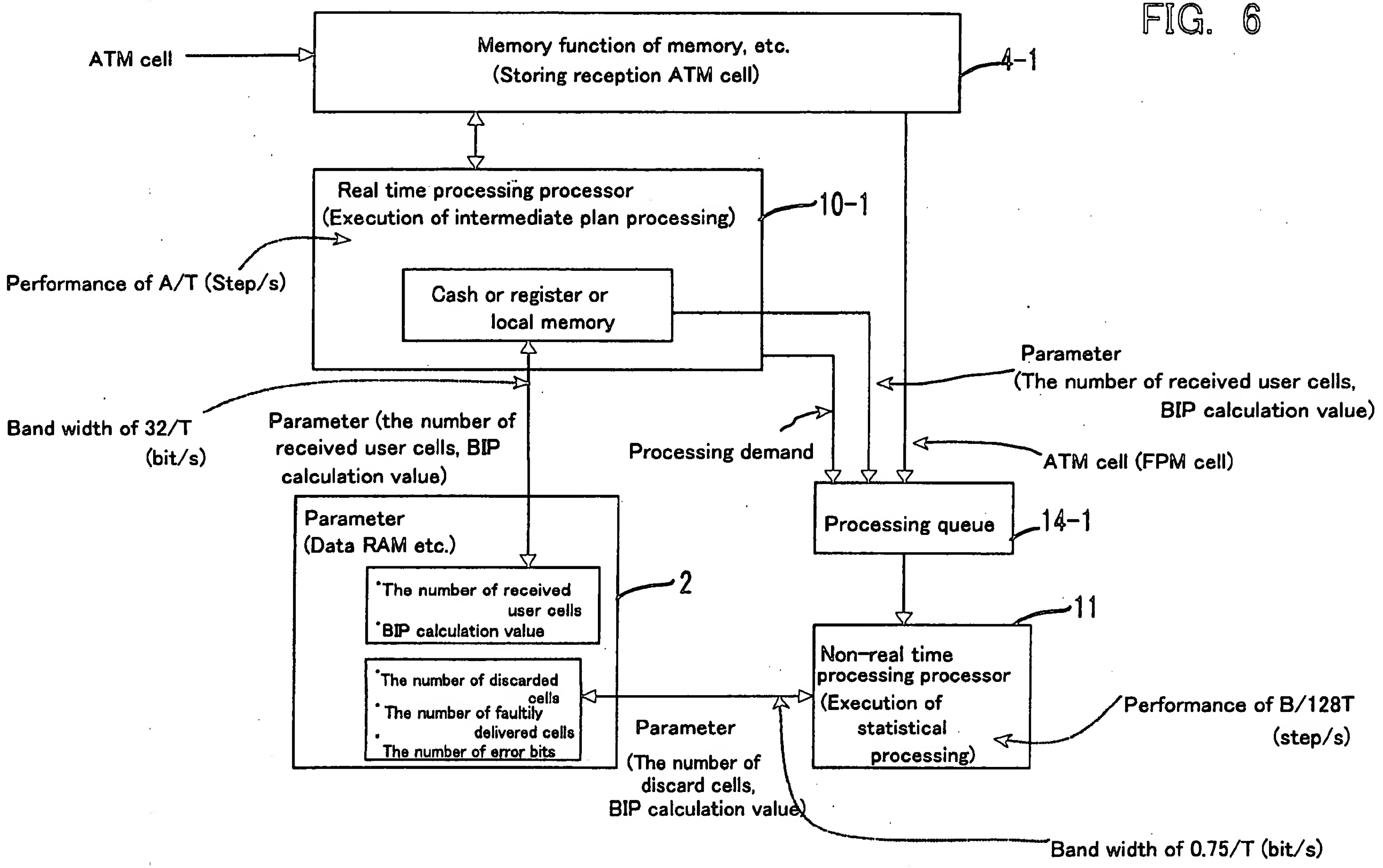
O.G. FIG.
CLASS
SUBCLASS

FIG. 6



APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 7

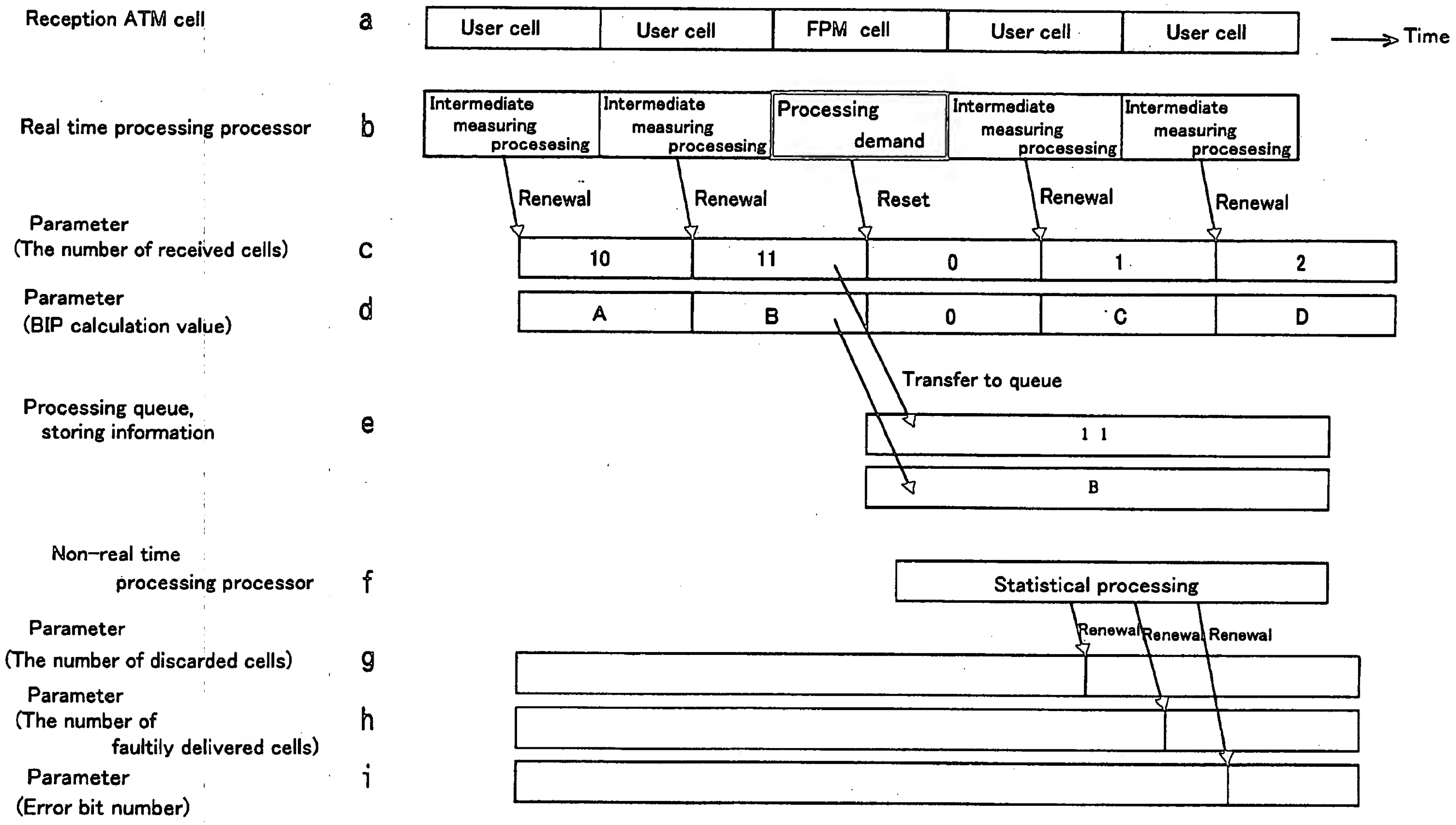


FIG. 8A

ATM cell transmission side

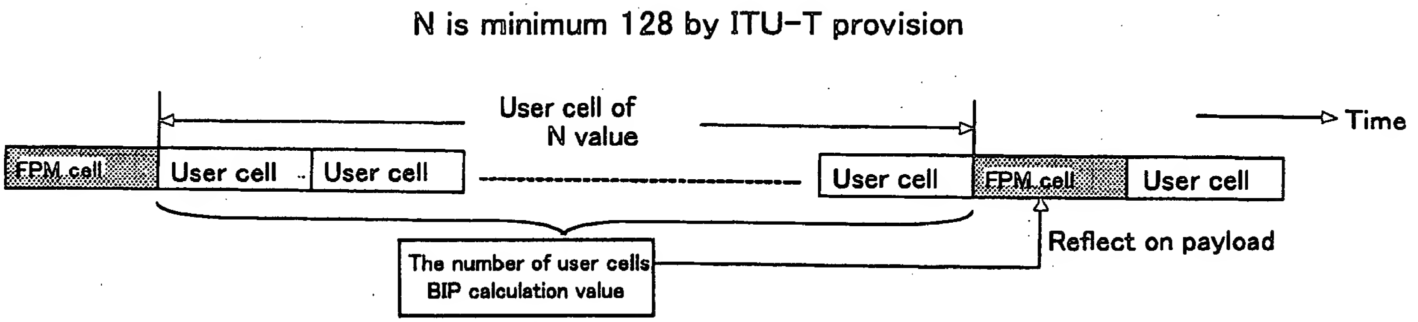


FIG. 8B

ATM cell reception side

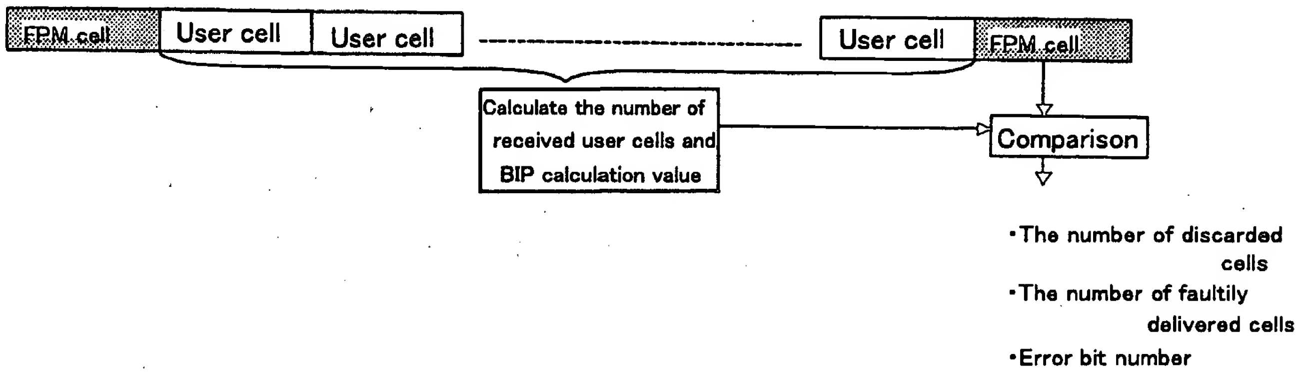
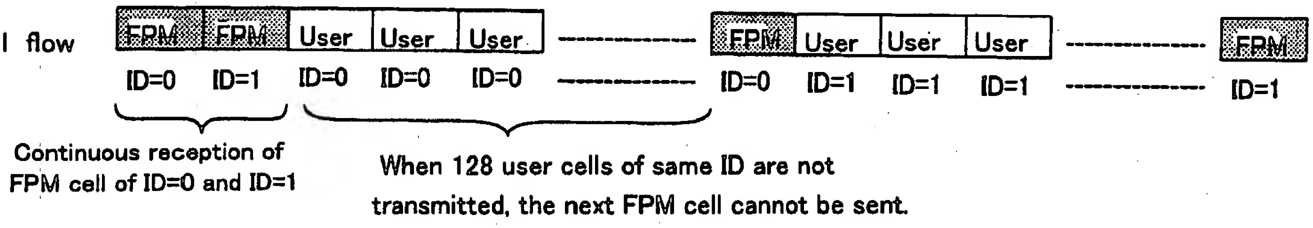


FIG. 8C

ATM cell flow



APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 9

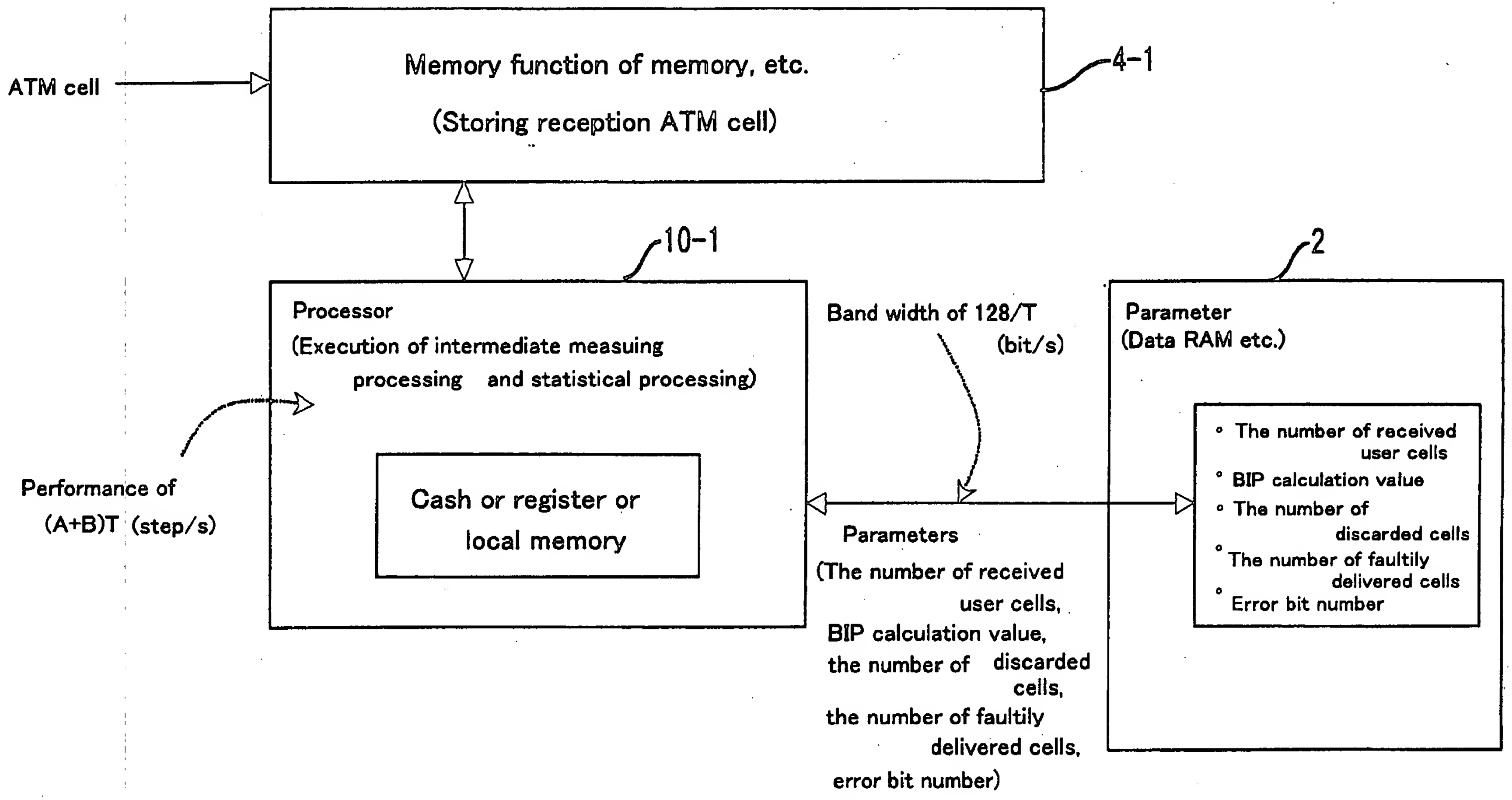


FIG. 10

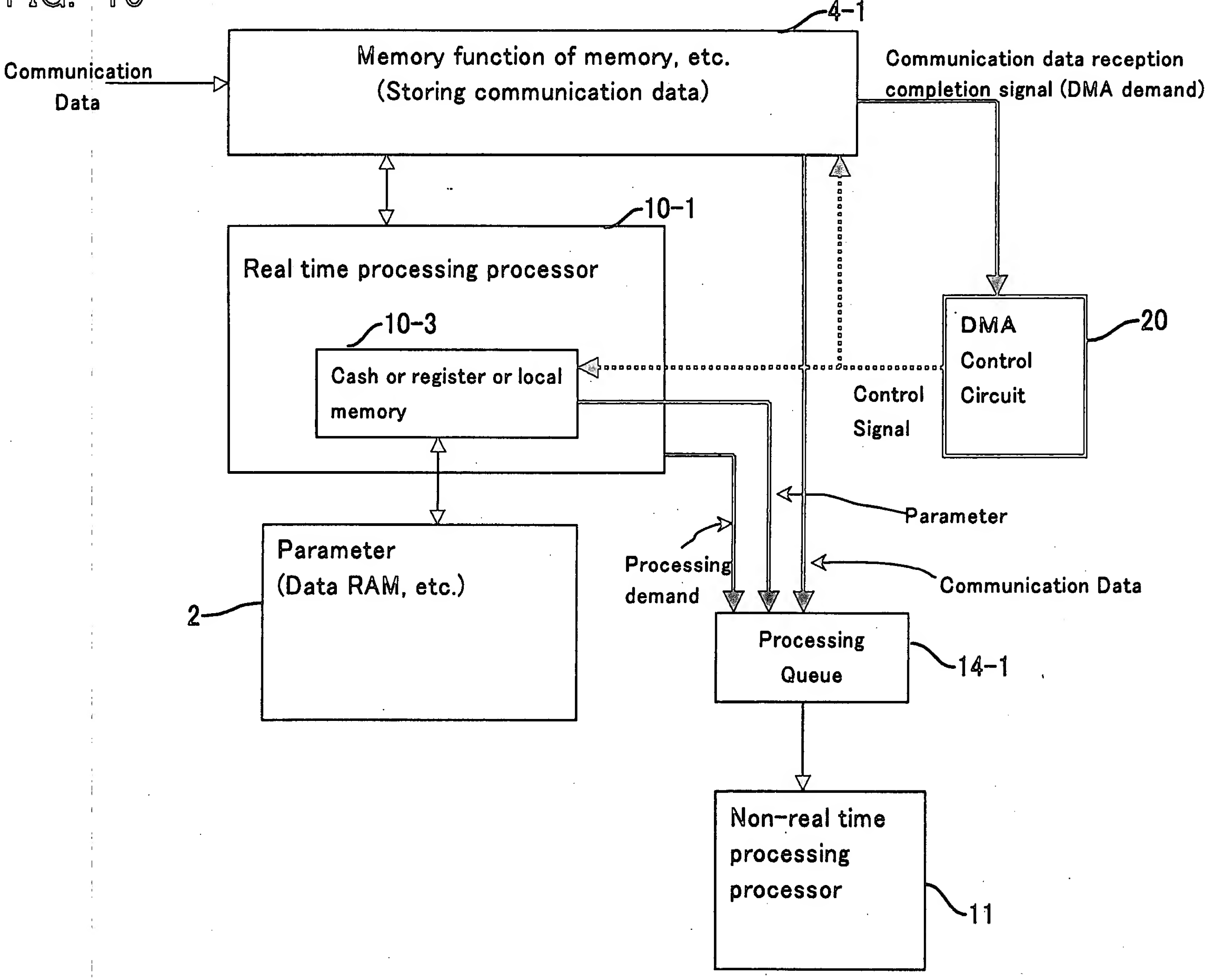

Communication Data
Memory function of memory, etc.
(Storing communication data)
4-1
Communication data reception completion signal (DMA demand)
10-1
Real time processing processor
10-3
Cash or register or local memory
DMA Control Circuit
20
Control Signal
Parameter
Parameter
(Data RAM, etc.)
2
Processing demand
Communication Data
Processing Queue
14-1
Non-real time processing processor
11

FIG. 11

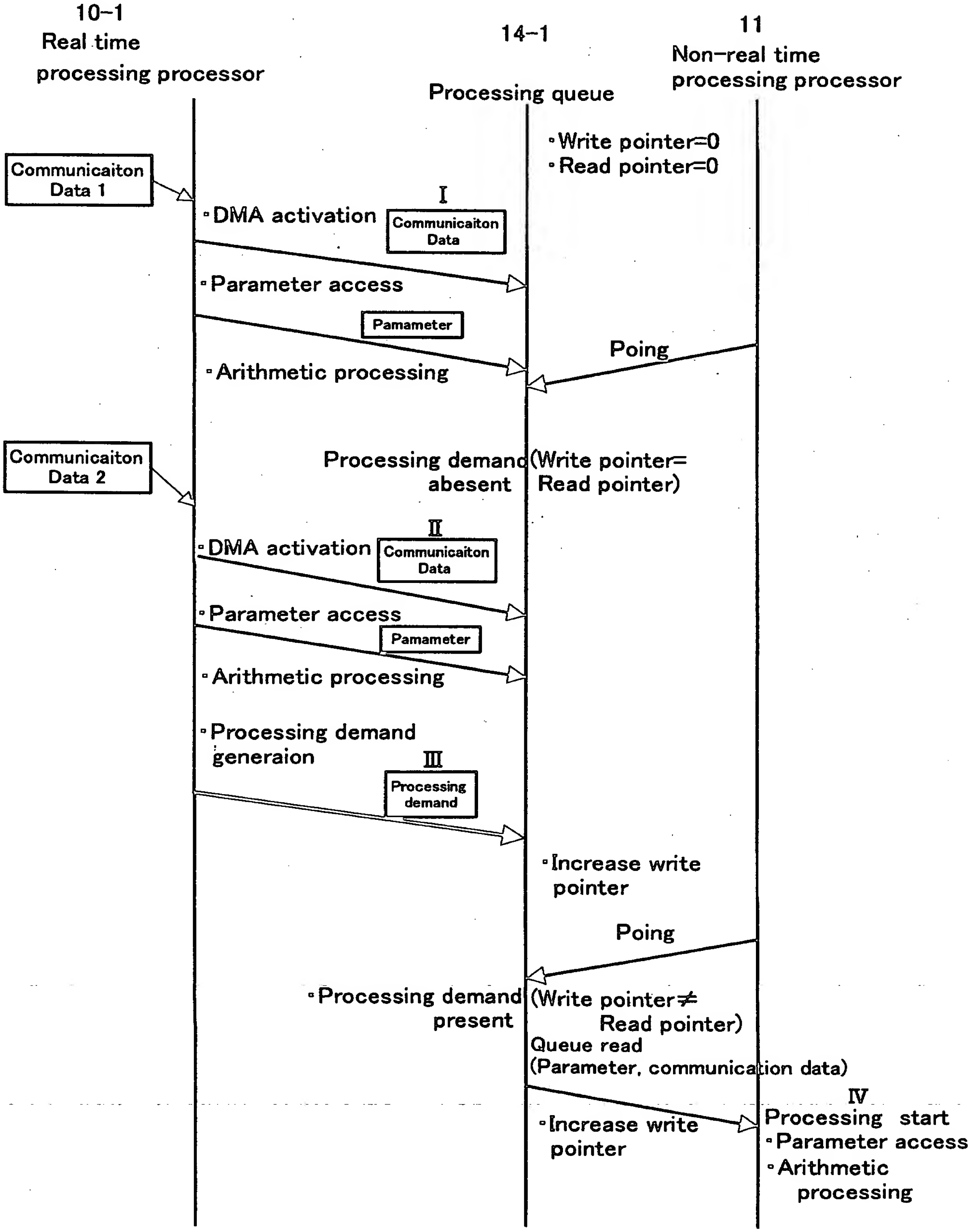
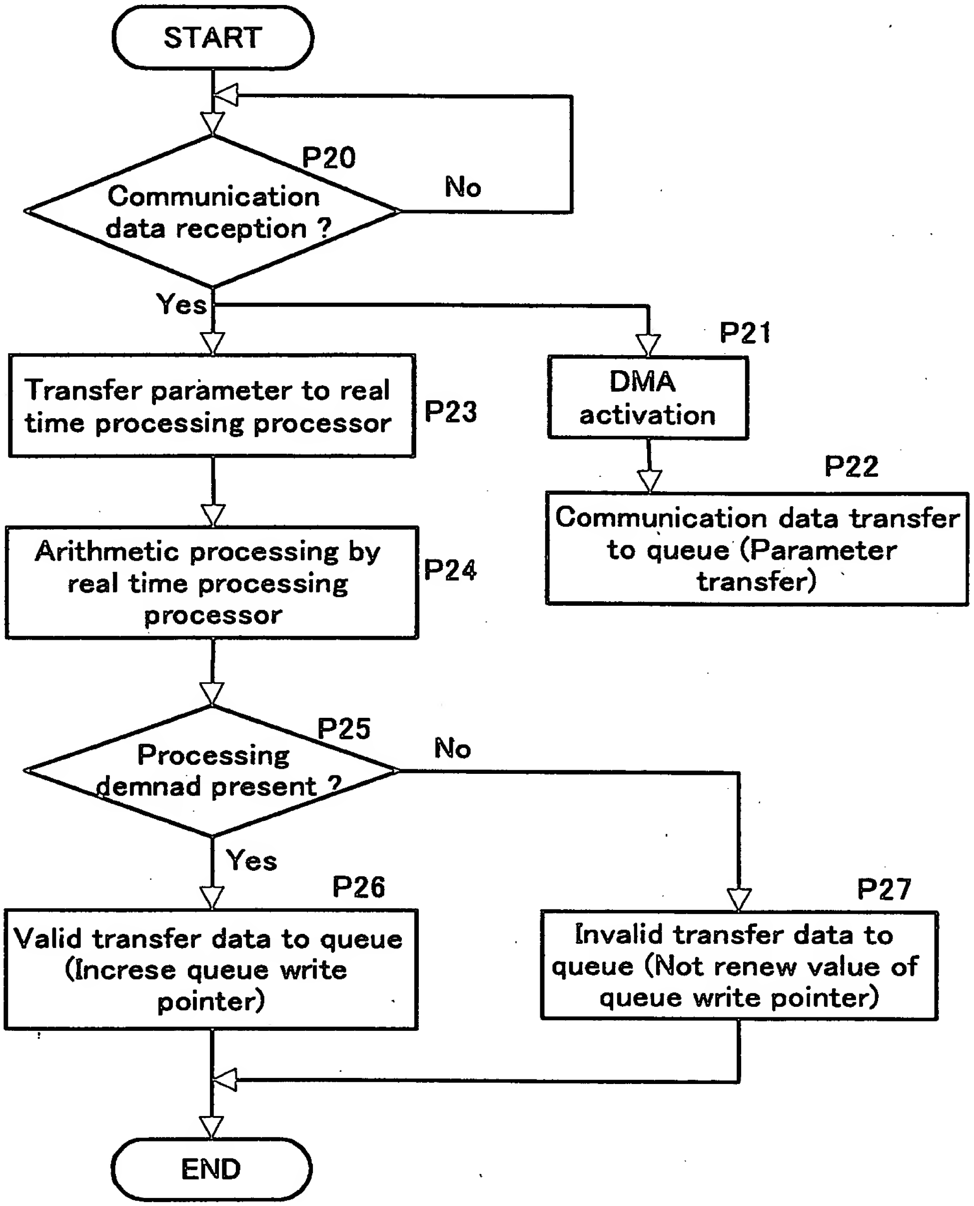

10-1
Real time processing processor
14-1
Processing queue
11
Non-real time processing processor
◦Write pointer=0
◦Read pointer=0
Communicaiton Data 1
I
◦DMA activation
Communicaiton Data
◦Parameter access
Pamameter
Poing
◦Arithmetic processing
Communicaiton Data 2
Processing demand abesent
(Write pointer= Read pointer)
II
◦DMA activation
Communicaiton Data
◦Parameter access
Pamameter
◦Arithmetic processing
◦Processing demand generaion
III
Processing demand
◦Increase write pointer
Poing
◦Processing demand present
(Write pointer≠ Read pointer)
Queue read
(Parameter, communication data)
IV
Processing start
◦Parameter access
◦Arithmetic processing
◦Increase write pointer

FIG. 12


START
P20
Communication data reception ?
No
Yes
P21
DMA activation
P22
Communication data transfer to queue (Parameter transfer)
Transfer parameter to real time processing processor
P23
Arithmetic processing by real time processing processor
P24
P25
Processing demnad present ?
No
Yes
P26
Valid transfer data to queue (Increse queue write pointer)
P27
Invalid transfer data to queue (Not renew value of queue write pointer)
END

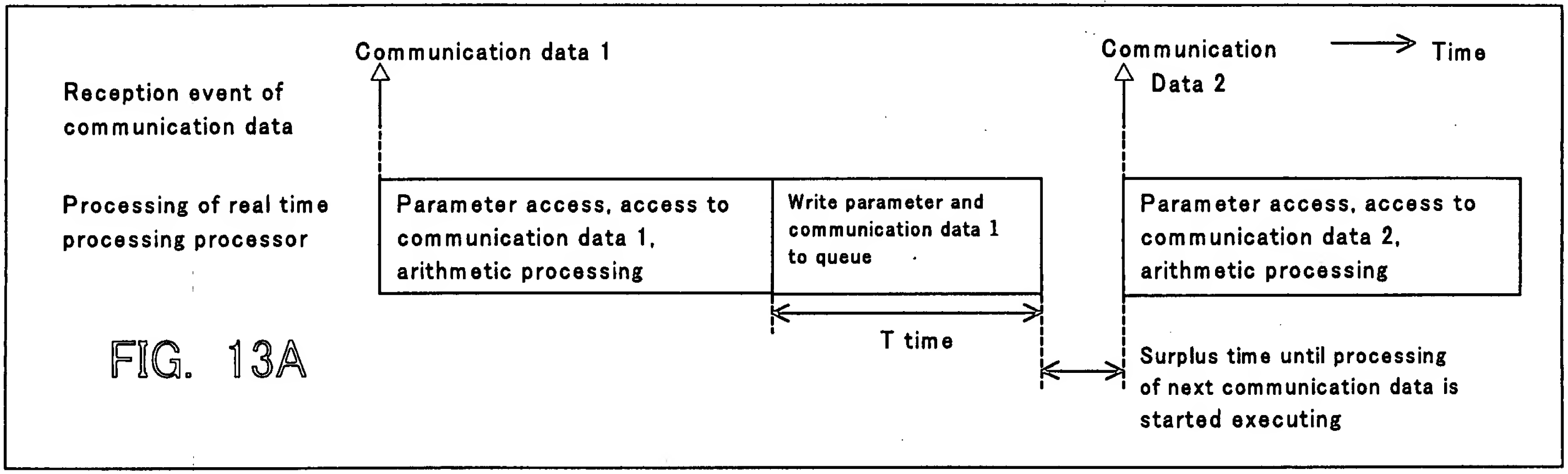


FIG. 13A

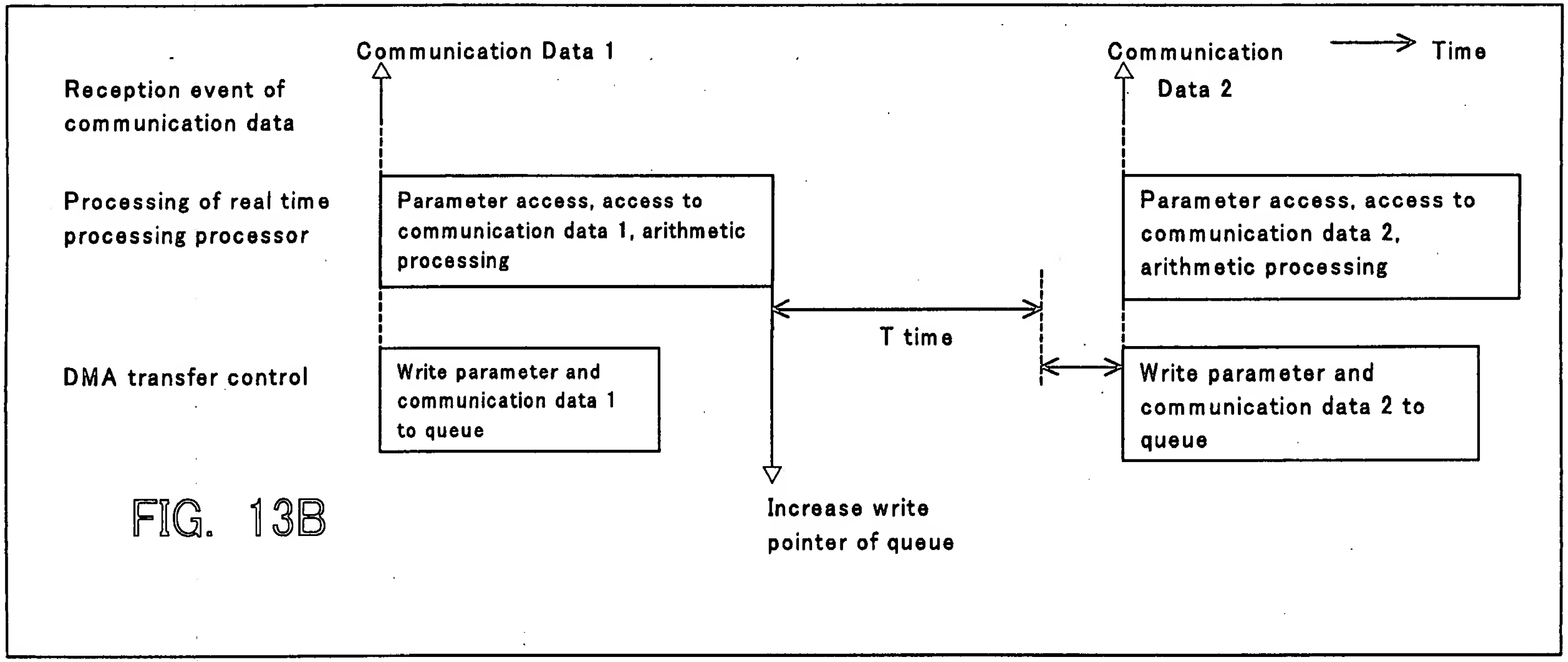


FIG. 13B

FIG. 14

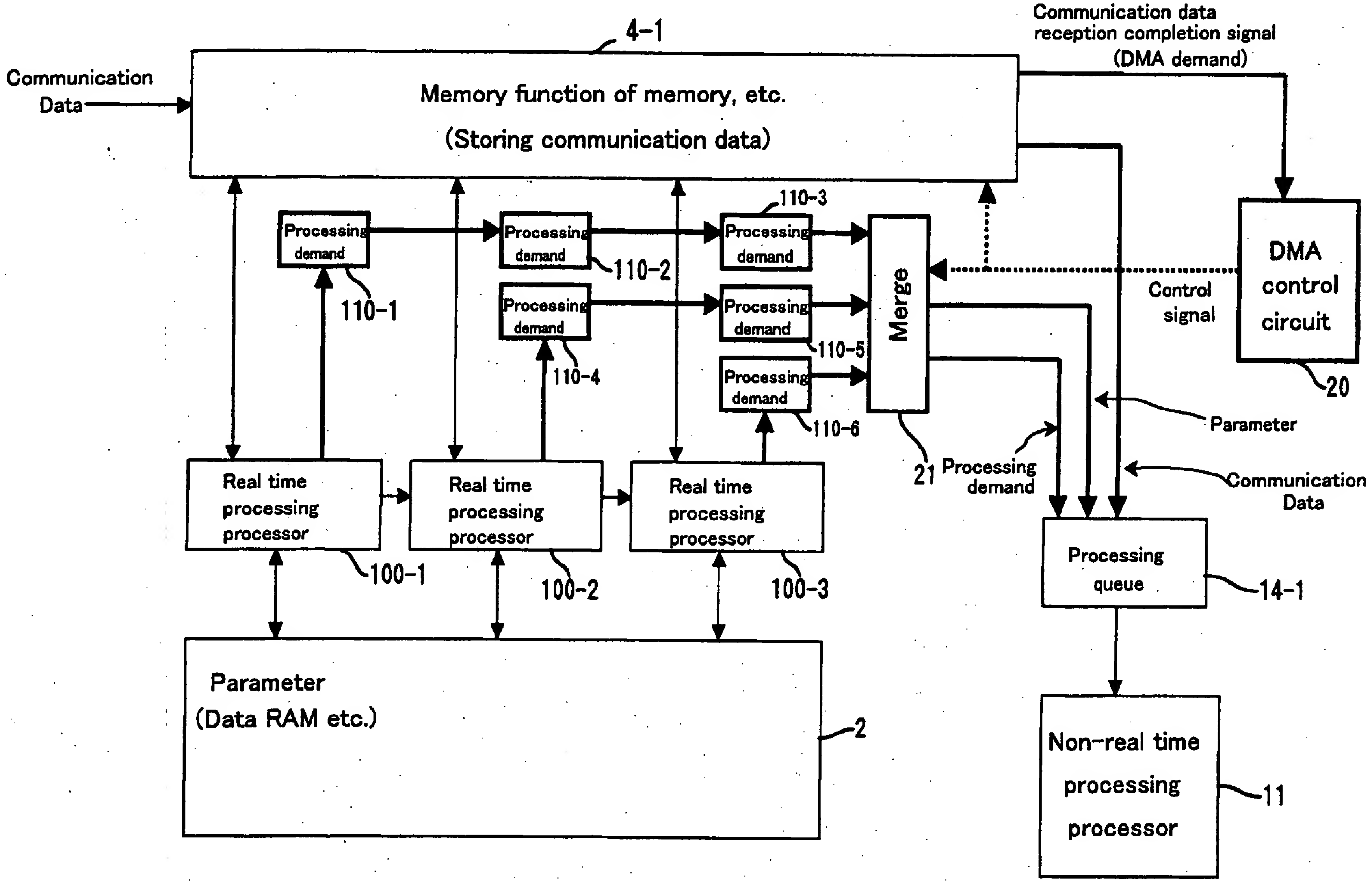

4-1
Communication Data
Memory function of memory, etc.
(Storing communication data)
Communication data reception completion signal (DMA demand)
DMA control circuit
20
Control signal
Processing demand
110-1
Processing demand
110-2
Processing demand
110-4
Processing demand
110-3
Processing demand
110-5
Processing demand
110-6
Merge
21
Processing demand
Parameter
Communication Data
Real time processing processor
100-1
Real time processing processor
100-2
Real time processing processor
100-3
Processing queue
14-1
Parameter
(Data RAM etc.)
2
Non-real time processing processor
11

FIG. 15

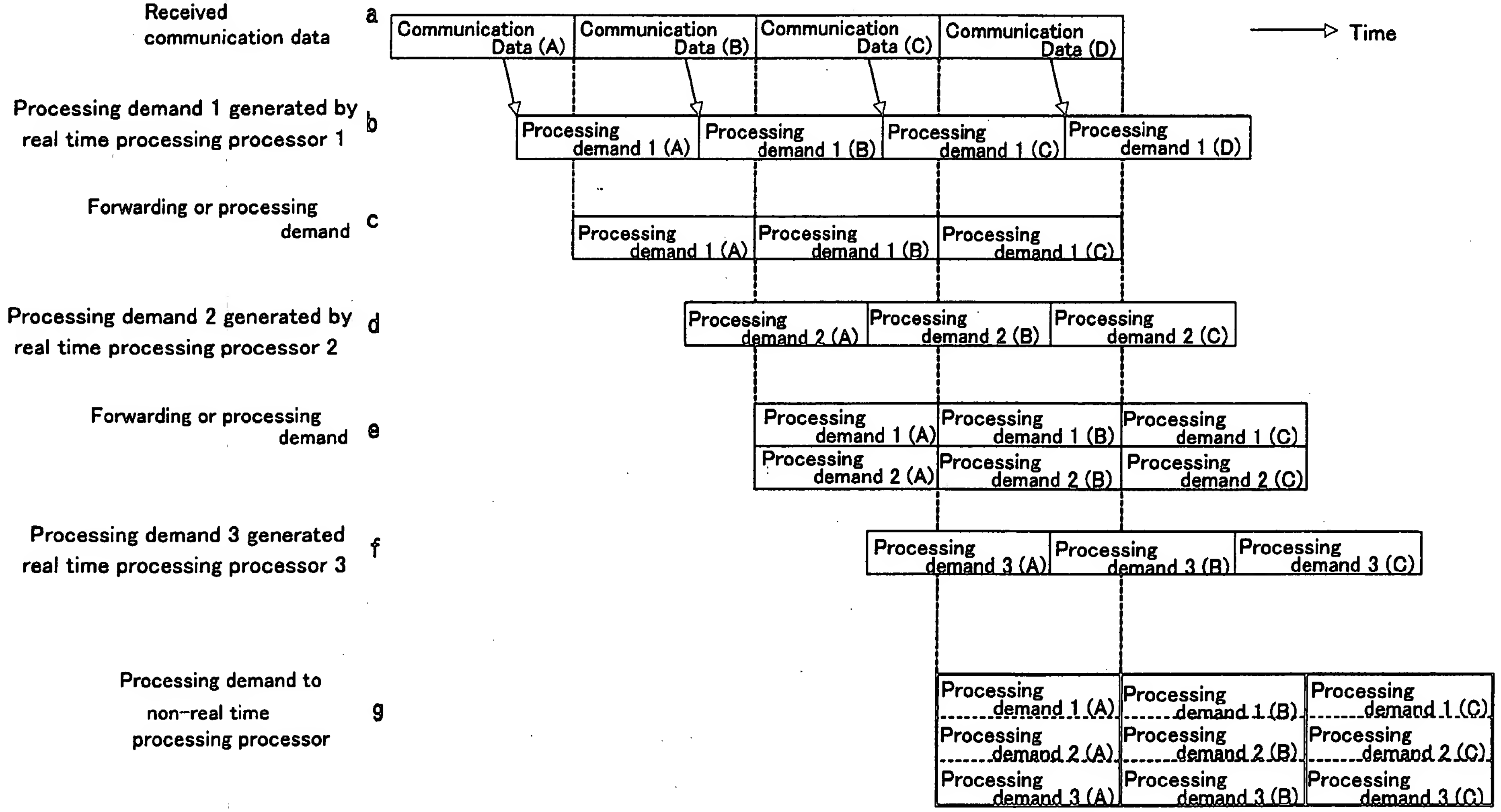

Time
a
Received communication data
Communication Data (A)
Communication Data (B)
Communication Data (C)
Communication Data (D)
b
Processing demand 1 generated by real time processing processor 1
Processing demand 1 (A)
Processing demand 1 (B)
Processing demand 1 (C)
Processing demand 1 (D)
c
Forwarding or processing demand
Processing demand 1 (A)
Processing demand 1 (B)
Processing demand 1 (C)
d
Processing demand 2 generated by real time processing processor 2
Processing demand 2 (A)
Processing demand 2 (B)
Processing demand 2 (C)
e
Forwarding or processing demand
Processing demand 1 (A)
Processing demand 1 (B)
Processing demand 1 (C)
Processing demand 2 (A)
Processing demand 2 (B)
Processing demand 2 (C)
f
Processing demand 3 generated real time processing processor 3
Processing demand 3 (A)
Processing demand 3 (B)
Processing demand 3 (C)
g
Processing demand to non-real time processing processor
Processing demand 1 (A)
Processing demand 1 (B)
Processing demand 1 (C)
Processing demand 2 (A)
Processing demand 2 (B)
Processing demand 2 (C)
Processing demand 3 (A)
Processing demand 3 (B)
Processing demand 3 (C)

FIG. 16

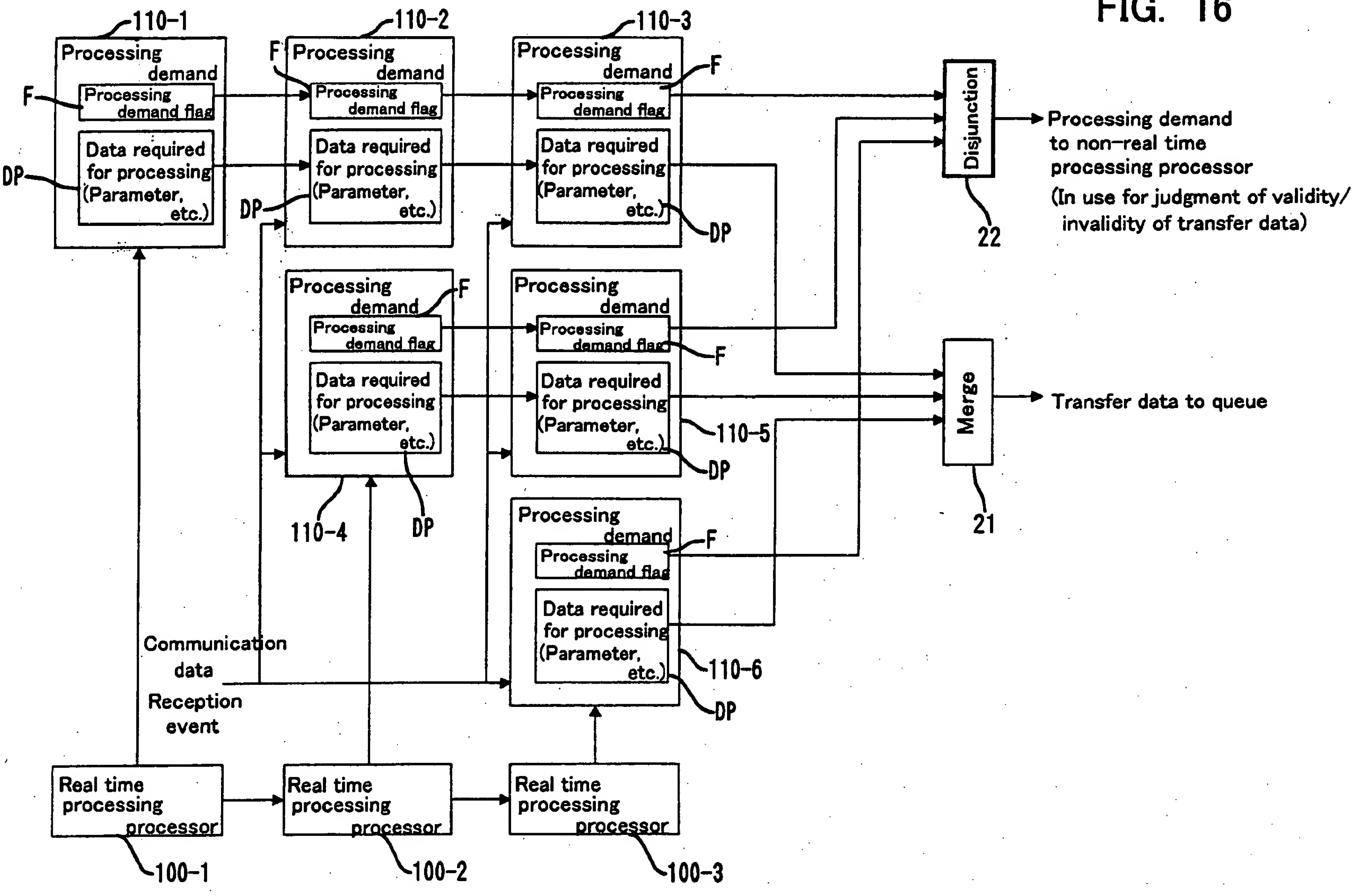

110-1
Processing demand
Processing demand flag
Data required for processing (Parameter, etc.)
F
DP
110-2
110-3
110-4
110-5
110-6
Disjunction
22
Processing demand to non-real time processing processor
(In use for judgment of validity/ invalidity of transfer data)
Merge
21
Transfer data to queue
Communication data
Reception event
Real time processing processor
100-1
100-2
100-3

FIG. 17

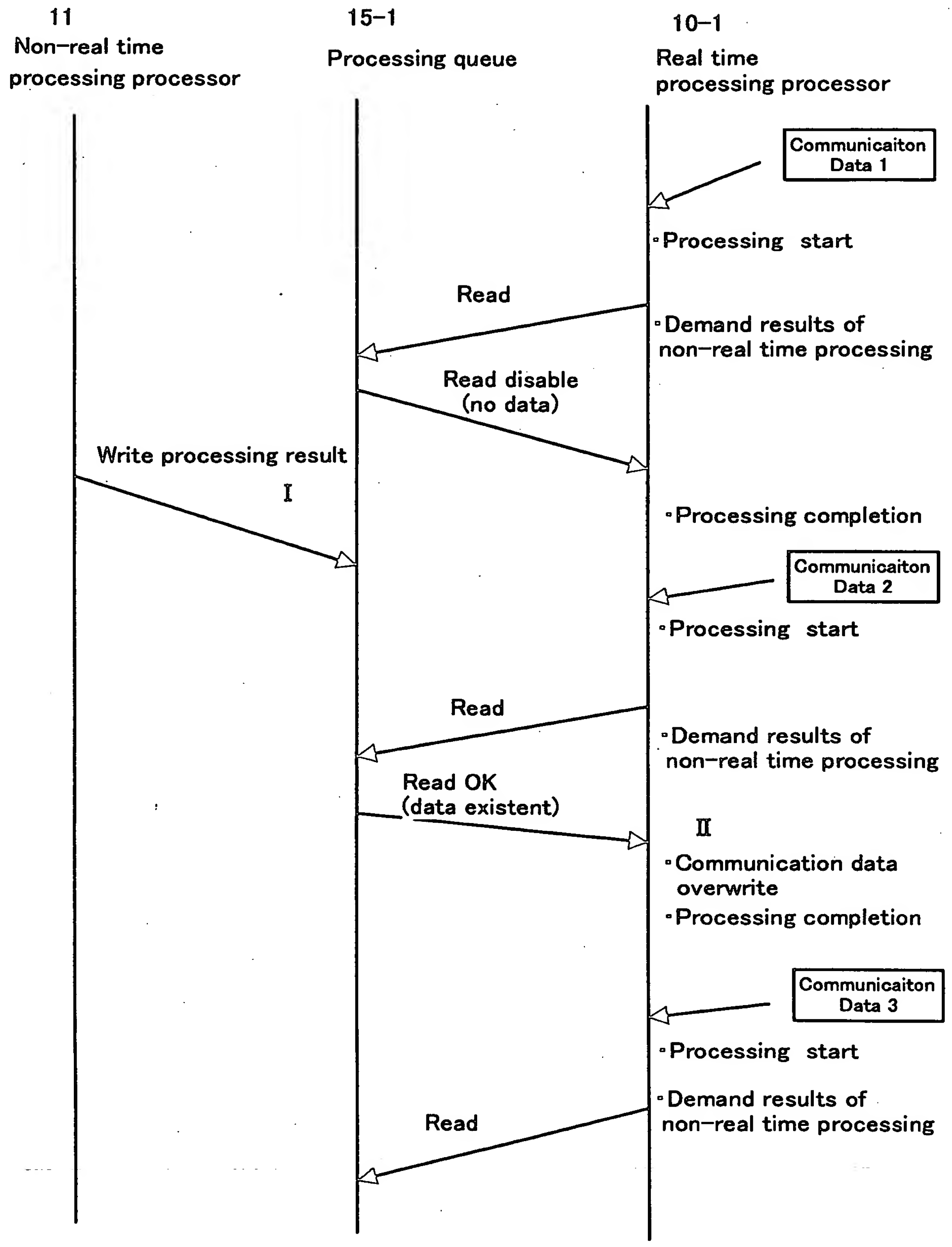
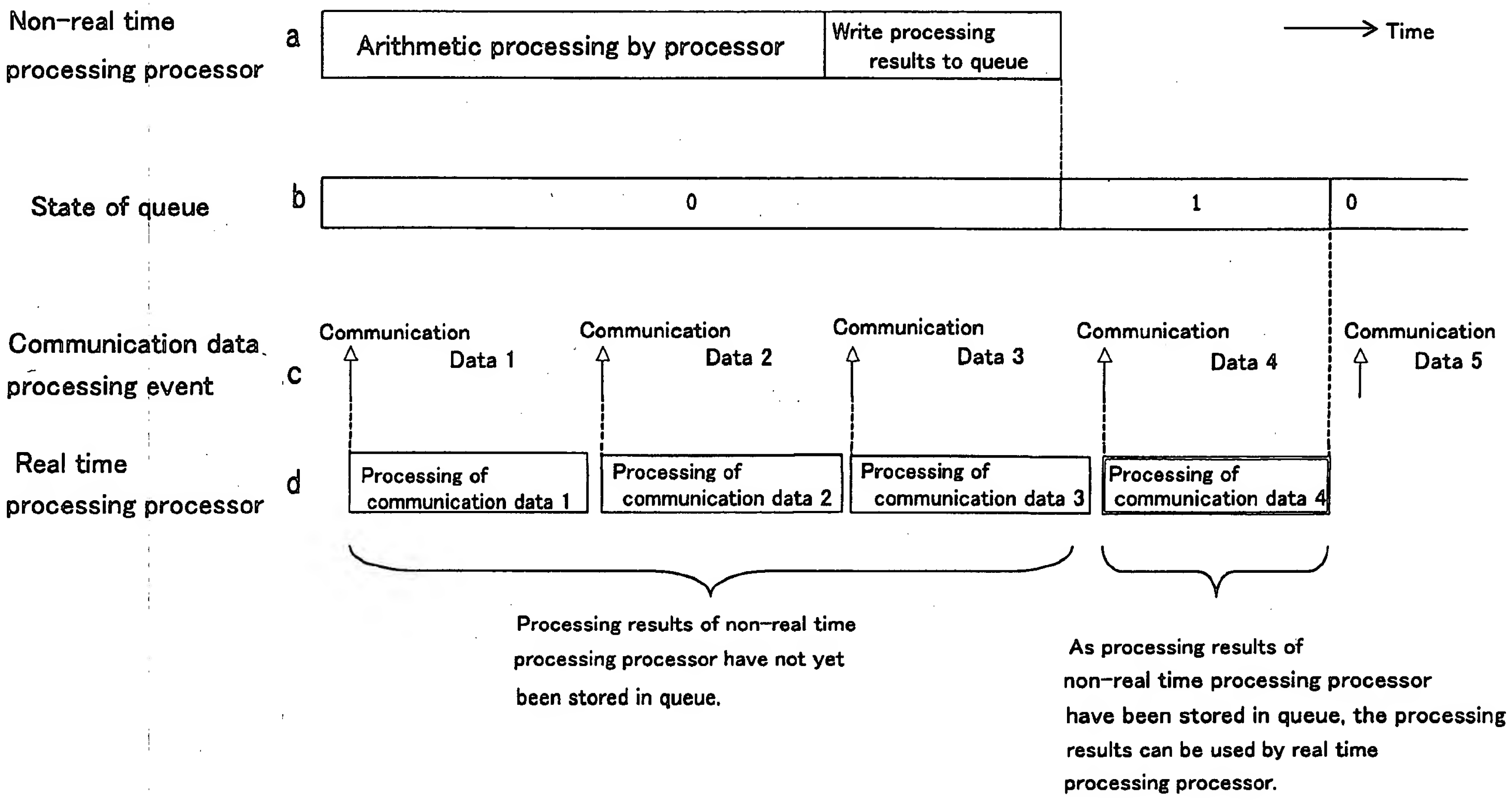

11
Non-real time processing processor
15-1
Processing queue
10-1
Real time processing processor
Communicaiton Data 1
◦Processing start
Read
◦Demand results of non-real time processing
Read disable (no data)
Write processing result
I
◦Processing completion
Communicaiton Data 2
◦Processing start
Read
◦Demand results of non-real time processing
Read OK (data existent)
II
◦Communication data overwrite
◦Processing completion
Communicaiton Data 3
◦Processing start
◦Demand results of non-real time processing
Read

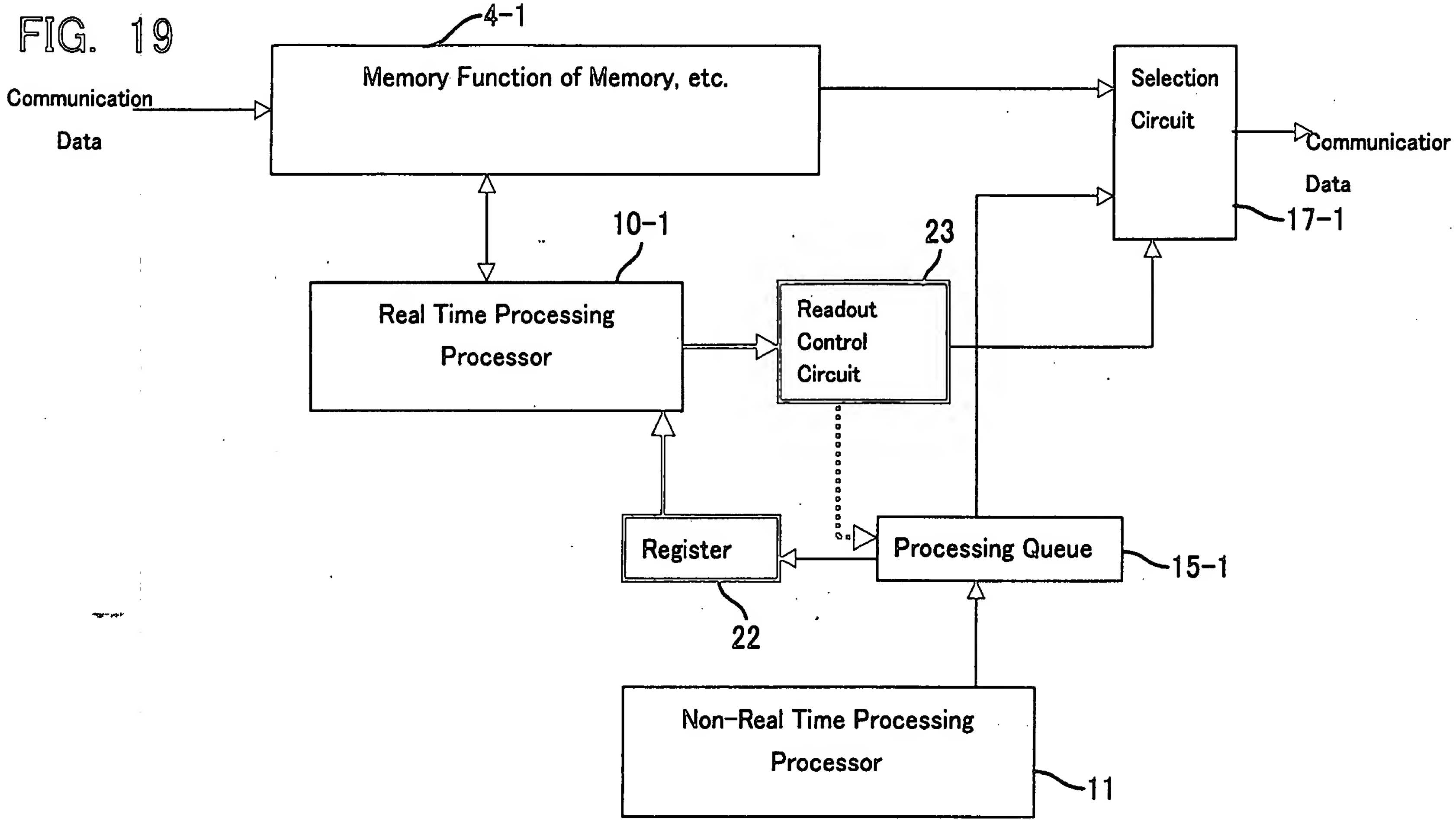
FIG. 18



Processing results of non-real time processing processor have not yet been stored in queue.

As processing results of non-real time processing processor have been stored in queue, the processing results can be used by real time processing processor.

FIG. 19


4-1
Communication Data
Memory Function of Memory, etc.
Selection Circuit
Communicatior Data
17-1
10-1
Real Time Processing Processor
23
Readout Control Circuit
Register
22
Processing Queue
15-1
Non-Real Time Processing Processor
11